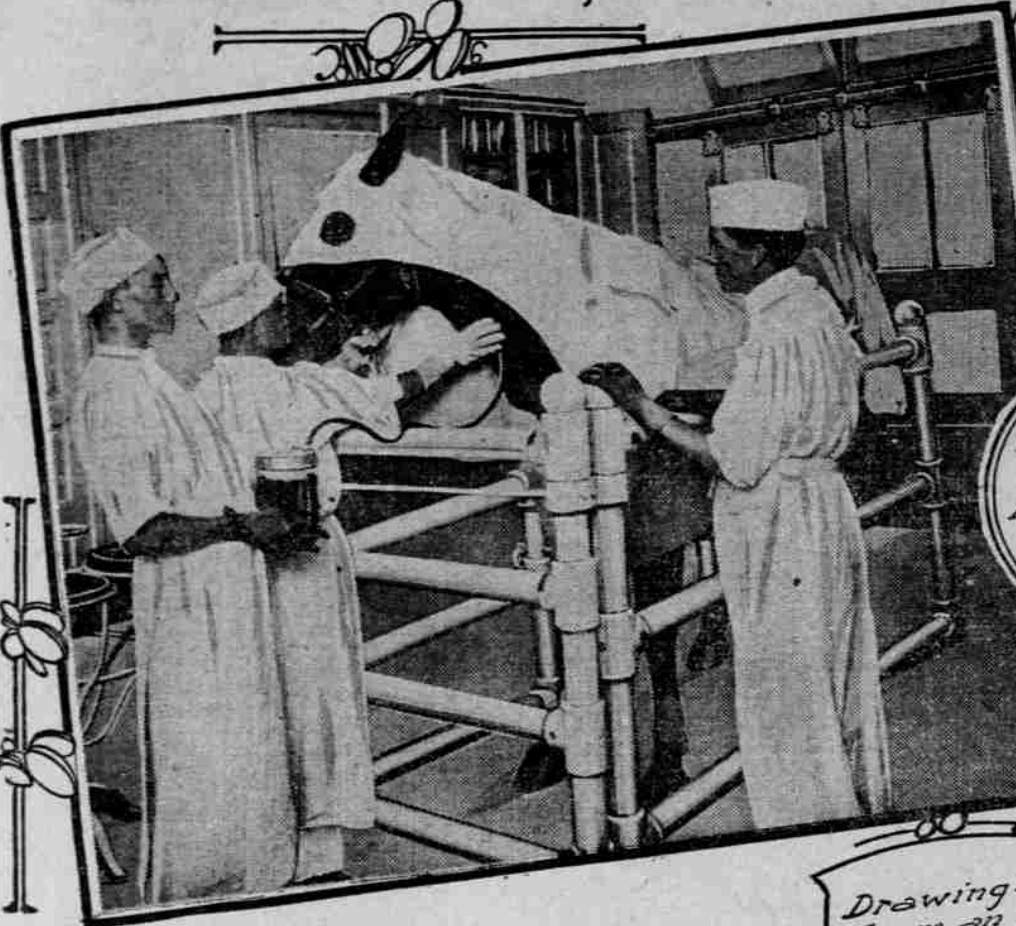


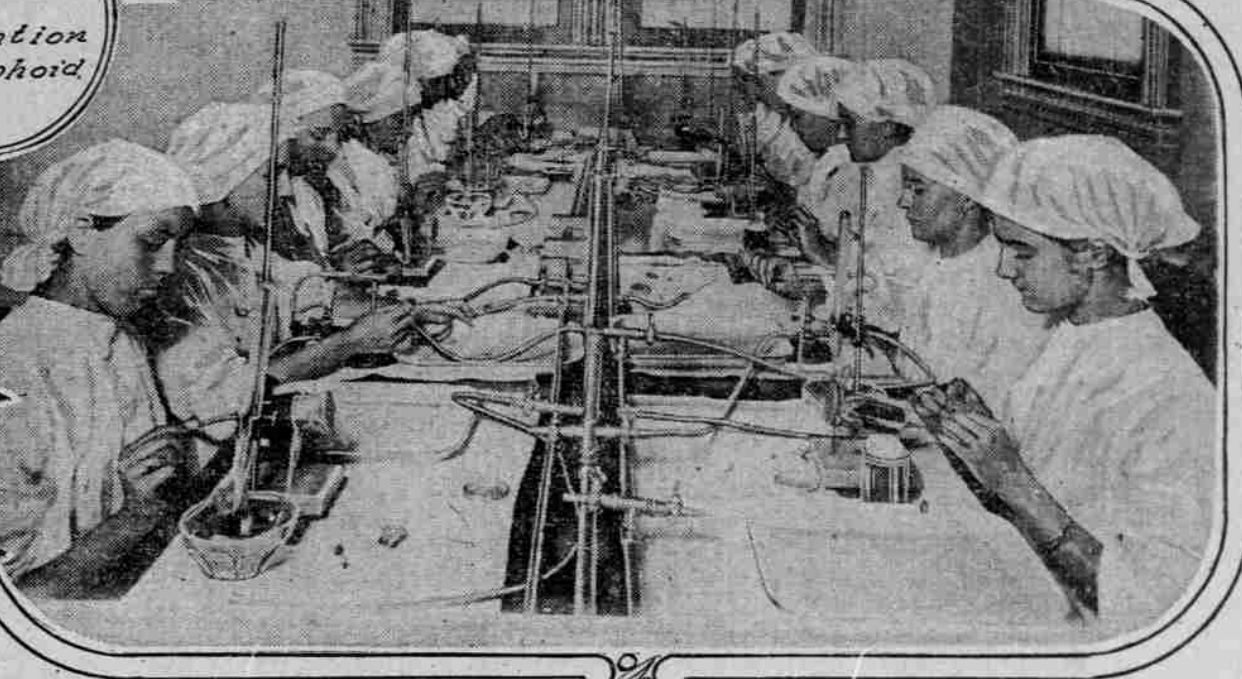
WARFARE AGAINST GERMS THAT RAVAGE ARMIES.

Bacteriology Playing An Important Part In Great European Conflict.



Inoculation for Prevention of Typhoid

Inoculating a Horse with Tetanus Toxin.



Putting Up Vaccine "Points" in Fire-sealed Glass Tubes.

Drawing Blood From an Inoculated Horse for Making Tetanus Serum.

BY RENE BACHE.

In every war hitherto disease has killed more men than have been slain in battle. But it is not going to be so in the great conflict now in progress; for science, armed with new knowledge, has entered the field, and is prepared to fight the germs which are so justly dreaded as destroyers of armies.

Take lockjaw, for example. This malady, so extremely fatal, has already made its appearance among the troops of the allies. But it will be quickly checked, because the surgeons have newly found out what causes it, and they are provided with a ready preventive. They know that the germs of the disease are carried in the intestines of the horses, and thus distribute the infection.

If the germs find their way into a wound, lockjaw is likely to follow. But—oddly enough, as it might seem—the horse itself is made to furnish the cure. Through a filter is strained a "culture" of the microbes, which are thereby eliminated, the fluid thus purified containing only the specific poison which the bacilli produce. This fluid is injected in repeated doses into the veins of a horse. Then, after a while, a quantity of the animal's blood is drawn off into a glass vessel, and the watery part of it (the red portion being allowed to settle to the bottom) is the "antitoxin." The French and British soldiers are now being inoculated with this preventive serum on a wholesale scale.

The bacillus of lockjaw (or tetanus) has the shape of a pin—the head containing a spore, which is thrown off

like a seed for the purpose of reproduction. Introduced into the bloodstream of a human being, the spore soon hatches, and in a short time the vital fluid is filled with the deadly germs. The latter produce a poison of an intensely virulent character, which quickly kills—the symptoms closely resembling those of strychnine poisoning. Usually the sufferer dies of suffocation.

It is altogether possible that the fetching of the native troops from India may cause mischief to the allies far outweighing in importance their value as military auxiliaries. For India is the home of Asiatic cholera, and they may have brought this frightful plague with them. As far back as 1883 it was proved by the Koch Commission that the Delta of the Ganges is the original source from which the malady comes. It is permanently established in that region now, as for ages in the past, and at intervals spreads from thence to many parts of the world. In 1892, which was a "cholera year," 250,000 people died of it in Russia.

No wonder then that the Russians are fearful lest their troops contract the cholera in Galicia, where, according to newspaper accounts, it is already working havoc among the Austrians. It is one of the most infectious of known diseases, and once started as an epidemic among the soldiers of the Czar, it might prove a far more dangerous enemy than the Germans. Whole armies might be literally wiped out by it in a few weeks.

An epidemic of Asiatic cholera which

started in New York City in 1876, reached St. Louis in the Fall of that year, and "wintered over" there—a result being the troops leaving Jefferson Barracks in the following Spring scattered it through Kansas and a wide extent of territory beyond. This distribution of the malady was attributable to a few "mild cases," which were not medically recognized. The men thus effected, who exhibited no symptoms more serious than a slight diarrhea, were what is known today as "carriers" of the germs.

It is such "carriers" that are most to be dreaded. One of them may infect a whole regiment, through the medium of the water supply. When, in the middle '90s, some troops from India were transported to Egypt by the British government for service in the Sudan, they brought cholera with them in this way, and a serious outbreak followed. Thus it will be seen that the danger now threatening from the same source in Europe is by no means imaginary.

The mortality from cholera in an epidemic is enormous, an attack being usually followed by death within 48 hours. Cats are subject to it, by the way. The germ is of a spiral shape; but the spirals break up into short

lengths resembling commas in form, whence the name, "comma bacillus." Flies are frequent carriers of the disease, conveying the germs from camp latrines to the mess tables and open-air kitchens. During the present war, however, there will be comparatively little danger from this disease, because the soldiers either have been allowed to carry the germs from the camp latrines to the mess tables and open-air kitchens. During the present war, however, there will be comparatively little danger from this disease, because the soldiers either have been allowed to carry the germs from the camp latrines to the mess tables and open-air kitchens. During the present war, however, there will be comparatively little danger from this disease, because the soldiers either have been allowed to carry the germs from the camp latrines to the mess tables and open-air kitchens.

many of our soldiers seem to have been mainly due to flies, which, in the ignorance of those days, were freely allowed to carry the germs from the camp latrines to the mess tables and open-air kitchens. During the present war, however, there will be comparatively little danger from this disease, because the soldiers either have been allowed to carry the germs from the camp latrines to the mess tables and open-air kitchens. During the present war, however, there will be comparatively little danger from this disease, because the soldiers either have been allowed to carry the germs from the camp latrines to the mess tables and open-air kitchens.

the disease. In earlier days the malady was widely and continually prevalent nearly everywhere, but now one rarely hears of it, for the reason that, in civilized countries, at all events, cleanliness has become popular. It follows that, where soldiers are concerned, prevention lies in requiring them to keep themselves free of vermin.

The present war is from all points of view a highly scientific conflict, and for the first time in history sanitation obtains recognition as a very important element of the military art. Sick men cannot fight. The soldier who dies of disease is just as great a loss as the fighting man who is killed in battle. Other things being equal, the army that has the fewest sick is bound to win. Accordingly, for the sake of winning, even more than for humane motives, the nations now battling in Europe are making utmost efforts to preserve the health of their troops.

All epidemic maladies are more destructive to soldiers in the field than to communities enjoying the blessing of peace, because effective sanitary measures are less easily enforced, and for the reason that the sufferers commonly lack the advantage of nursing and other care which they would enjoy at home. But, thanks to the discoveries of modern science, the loss of life from "camp diseases" during the present conflict will be vastly less, relatively to the number of fighting men engaged, than in any previous war.

One of the most dreaded of these scourges in former days was smallpox, which is now practically eliminated by vaccination. The dangers of epidemic dysentery are greatly reduced by precautions which relate mainly to water supply and the disinfection of wastes. As the very newest contribution to disease-prevention in behalf of armies, it is announced that the long-sought germ responsible for gangrene of wounds—the destroyer of myriads of lives in the military hospitals of wars of the past—has been discovered.

This last is a matter of very great importance. But the mortality from gangrene nowadays is comparatively small, because the antiseptic treatment of wounds, if promptly bestowed, is an effectual preventive.

HOW AN AMERICAN WOMAN IS NURSING WOUNDED SOLDIERS BEHIND THE FIRING LINE.

With Her Husband She Has Established a Dressing Station in the Battle Zone.

TO set up a field hospital behind the German-allies' battle line that the wounded may have prompt attention, a Washington woman has gone to the forefront of the war.

Dr. Sophie A. Nordhoff-Jung has sacrificed a large practice here, built up during 20 years, with patients from the White House, with practically all the embassies and legations. She has abandoned her carefully equipped operating rooms and elegantly furnished home at 1229 Connecticut avenue, and since the day war was declared has been doing most efficient work for the Red Cross in Germany.

Her husband, Dr. Franz Jung, is co-operating with her. Both are surgeon specialists. Dr. Jung has been decorated with the German Red Eagle for science and with the Russian order for science.

Her purpose of establishing a battleground hospital, which she has reported to the American Red Cross headquarters here, at Seventeenth and H streets northwest, is impelled by tender recollections as well as by sympathy for the suffering whose wounds would be aggravated by being carried long distances for treatment.

She goes to ameliorate the sufferings of those defending the very place in which she lived, played and studied as a little girl. The most tender recollections of her childhood gather around Toul. As a child of 6 years she was taken there with her sister, aged 8, by a community of nuns in Germany. After the religious war, the Kulturkampf, in which the Iron Chancellor, Count Bismarck, was a leading figure, these nuns were expelled from Germany, and took about 200 of their little charges with them to other houses of their order in France.

Dr. Nordhoff-Jung and her husband were in Munich when war was declared. Within a week she had more than 100 American women resident in Munich and members of the German aristocracy enrolled in a training school for nurses, which she established in rooms connected with the American Episcopal Church. Those whom she thus taught



Dr. Sophie Nordhoff-Jung with a Wounded Soldier on Roof Garden of Hospital at Munich.

have proved invaluable in the care of the war victims.

Dr. Nordhoff-Jung has for years been a personal friend of Miss Mabel T. Boardman, executive chairman of the American Red Cross European war relief work, and of her mother, Mrs. William J. Boardman. Acting in co-operation with the American Red Cross and at the solicitation of the committee were Frances B. Willard, of New York; J. H. Griswold, of Illinois; Marion Lindsay, of Missouri; S. M. Fenn, of New York; Jacques Mayer, of New York; Mrs. Charles Cahier, of Indiana; C. F. Thayer, of Massachusetts; John B. Bauer, of West Virginia; Julie A. Leathron, of Pennsylvania; Maud Fay, of California; Frank B. Herman, of New York; and Lawrence D. Benton, of California.

She has received valuable assistance and encouragement in her work from T. St. John Gaffney, the American Consul-General in Munich; from Mrs. Gaffney and from Dr. Colt, formerly of Groton Academy in Massachusetts, who has recently been in charge of a boys' school in Munich.

Many American women have married officers of high military rank in the German army and, living in Munich, have enthusiastically assisted Dr. Nordhoff-Jung in her work. One of these is the Baroness von Hammerstein, another the Baroness von Ruppel, whose home formerly was in Worcester, Mass. Mrs. William Thaw, a sister-in-law of Harry K. Thaw, has been one of her most eager helpers.

Miss Maud Fay, a San Francisco girl, who is prima donna of the opera in Munich, is another. Miss Louise Patterson, in charge of the girls' school in Munich, also has been of great assistance, as well as Fraulein Hanfstaengl, of the Red Cross in Munich, have been invaluable in the co-operation and assistance that they have given.

The head nurse at this hospital is a graduate of the Johns Hopkins Training School and was formerly superintendent of an American hospital. Dr. Biessell, who succeeded Dr. Colt in charge of the Boys' School, and Dr. Kuehnrich, of Los Angeles, secretary

of surgery from here and his staff have volunteered their services.

"Oh, the misery and the suffering one sees and hears of on all sides! When will it all end?"

Among the patients cared for in Dr. Nordhoff-Jung's hospital has been the former Burche of Count Courten, who was an officer in the bodyguard of the King of Bavaria. He was shot through the leg, the arm and chest. He has been decorated with the Iron Cross.

Her work of succor in Munich has brought a very pleasant reunion to Dr. Nordhoff-Jung. In the early days of her career as a doctor when she was at the Lying-in Hospital in Munich one of her most intimate friends was Prince Ludwig Ferdinand of Bavaria. They have again become associated in the work of mercy since the war has been in progress. The Prince is now a noted surgeon, and very popular not only among his own people, but is also a prime favorite as well with the American residents. He married a Spanish Princess, and is a finished musician, playing the first violin in the orchestra.

Dr. Nordhoff-Jung was born in northern Germany. While very young she was taken by the expelled nuns, and by her sister, to Toul, in France, and they later attended a large convent academy in Paris. Her sister afterward married Thomas J. Gargan, a prominent attorney of Boston, who was for many years a member of the original transit commission, took an active part in the development of the Charles River basin and a leader in all civic enterprises.

After having passed the German state examination for teachers, Miss Sophie A. Nordhoff came to America and taught languages in the Georgetown Visitation Academy for four years. She studied medicine at the Columbia University, now the George Washington University, and then took a post-graduate course at Johns Hopkins. She specialized in bacteriology in Paris, under the famous Louis Pasteur, under Metchnikoff and Le Roux.

Two petty officers have been furnished us, one to take care of the military papers, the uniforms and weapons, while the other acts as doorkeeper and has strict orders to let in no idle or curious people, who proved very troublesome in the beginning of our work here.

"These two petty officers receive no salaries from us, only their meals. We carry on our pay roll two persons; first, the young resident physician, whose salary is 100 marks a month, and the Johns Hopkins nurse, who gets 60 marks monthly. There are other nurses living in the house, but we pay only their board.

"We have 65 beds and pay to the pension which is running all the house-keeping department the agreed sum of 4.30 marks per head for each soldier. We furnish all the extras, such as hospital suits, nightshirts, underwear, socks, slippers, handkerchiefs, hospital linen, bandages, cotton, canes, crutches, tonics and medicines. The average cost of a patient per day amounts to a few pennies less than 6 marks—something like 5.97 marks, or less than \$1.50.

"The initial expenditure of changing a private house into a hospital amounted to several thousand marks. Aside from the first handsome contribution made by the transient American colony in August, we have received no further subscriptions from Americans in Germany. Most of them are hard up and have to economize.

"Thanks to the generous help from headquarters, we are free from care for the next five or six months. God grant that this frightful war may be over by that time.

"We have sent very many appeals to all parts of the United States. We expect to receive a great deal of money in answer to these appeals. When we get sufficient funds I am ready to start for the front near Metz and open a large American Red Cross hospital for seriously sick and wounded who cannot be transported as far as Munich. I have friends at work in Metz preparing the way. A professor

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